Behavior

No home, not alone

Estimates of the number of homeless people in the United States have varied widely, sparking heated debates over how best to count those who have fallen through society's cracks. A national survey now indicates that a surprisingly large number of people have been homeless at some time. These people often slept in shelters, bus or train stations, cars, abandoned buildings, or makeshift structures such as tents and boxes.

An estimated 12 million people, or 6.5 percent of all adults, in the United States have experienced such homelessness sometime during their lives, a research team reports in the July AMERICAN JOURNAL OF ORTHOPSYCHIATRY. Their unsettled state nearly always lasts for at least 1 week and often for a month or more, although most homeless people eventually end up with a roof over their head, the investigators note.

"Homelessness is generated in our society with substantially greater frequency than was previously believed," they conclude. "Our figures are, if anything, low, because currently homeless people were excluded from the sample."

The telephone survey, directed by epidemiologist Bruce Link of Columbia University in New York City, also missed households without telephones and institutional settings such as prisons and mental hospitals, where many inmates or residents have probably experienced homelessness.

In 1990, Link and his coworkers conducted telephone interviews with 1,507 randomly selected adults about their current and previous living arrangements. In 1994, the researchers interviewed 487 of the original participants in more detail, including those who had cited one or more periods of homelessness.

The estimated lifetime homelessness rate rises to about 15 percent of the adult U.S. population when it includes people who have moved into someone else's residence during periods when they had nowhere else to live.

Kids draw on their memories

A picture is worth a thousand words and, in the hands of a child, perhaps a few good memories. At age 5 to 6, children remember a pleasant personal experience in much more detail if they draw scenes from the event as they attempt to recount it for an adult, a new study finds.

Memory enhancement through drawing lasts for at least 1 month after such an experience, assert Sarnia Butler, a psychologist at the University of Otago in Dunedin, New Zealand, and her colleagues. However, it remains unclear whether drawing boosts children's recall of traumatic events, such as sexual abuse.

Butler's group studied 64 children age 5 to 6 and 32 children age 3 to 4 who participated in a school-organized trip to a fire station. They toured the site, observed drills by firefighters, tried on protective gear, and climbed in the fire engines. Several prearranged incidents also occurred in full view of the children, such as a collaborator sliding down a pole in the station and getting reprimanded for her action by the tour leader.

Both 1 day and 1 month later, 5- to 6-year-olds who were asked to draw and describe aspects of the trip—such as how they got to the fire station, what they saw, and who went with them—accurately reported far more information than their counterparts who were asked only to tell what happened. Drawing yielded no memory advantage for 3- to 4-year-olds. For both age groups, however, drawing showed no tendency to boost errors in memory, the researchers report in the July DEVELOPMENTAL PSYCHOLOGY.

For children with artistic ability, drawing may provide valuable visual cues for retrieving memories, Sarnia's group suggests. It may also enable youngsters to articulate details that they ignore in the course of a purely verbal conversation.

Biology

Bedwetting traced to genetic flaw

Researchers now believe that some children plagued by frequent nighttime bedwetting, an embarrassment many attribute to emotional problems at home, owe their discomfort to a mutation in a still-unknown gene on the long arm of chromosome 13.

To draw that conclusion, a Danish group from the Institute of Medical Biochemistry and Genetics in Copenhagen scanned the genomes of 11 families in which there was a history of children who wet their beds three or more times a night, even at age 7 and beyond. They investigated which genetic markers, pieces of DNA whose chromosomal locations are well known, were inherited by those who had had bedwetting problems but not by others in the family.

That enabled the Danish scientists to pinpoint an area on chromosome 13. This region does not contain any of the genes that researchers have in the past suggested might be responsible for nightly bedwetting, investigators note in the July NATURE GENETICS.

Lightly adjusting biological clocks

Inside most organisms tick biological clocks, timekeepers that determine when each day key biological functions are performed (see p.108). These clocks are not the finest examples of Swiss craftsmanship, however. Like watches that run slow or fast, almost none keeps an exact 24-hour cycle: The human clock has a period slightly longer than 24 hours, and in fruit flies periods range from 23.5 to 25 hours.

That doesn't make biological clocks useless. Just as a slow or fast watch is still effective if adjusted frequently, biological clocks keep accurate pace with the world by responding to external stimuli such as light and temperature. But how exactly do these stimuli adjust the clocks?

Researchers studying a bread mold's biological clock, which tells the organism the appropriate time of day it should send out spores, have now found one answer to that question. Brief pulses of light directed at the mold dramatically increase the activity of *freq*, a gene integral to its clock, Jay Dunlap and his colleagues at Dartmouth Medical School in Hanover, N.H., report in the June 30 CELL.

"It's a beautiful result. It's the first paper to show a direct effect of light on a presumed clock gene," says Joe Takahashi of Northwestern University in Evanston, Ill.

The activity of the *freq* gene normally peaks during the day and hits its lowest point at night, a conclusion drawn by measuring the production, or expression, of the gene's messenger RNA (mRNA). This molecule is an intermediary in the process by which the gene manufactures a protein.

When the Dartmouth team shone light on the mold, its production of *freq* mRNA skyrocketed. The same effect occurred at all points in the gene's daily cycle of activity. So even at the nadir of *freq* activity, a point which the mold's biological clock translates as night, the light pulses would shift the cycle to its daytime peak and advance the clock. If applied not long after *freq*'s peak, when mRNA levels had started to decline, the light would bring *freq* activity back to its peak, in effect turning back the hands of the clock.

"Turn the light on, and *freq* expression rises very fast," says Dunlap. "Just a few minutes of light resets the clock."

Dunlap and his colleagues still must trace the exact pathway by which a photon of light hitting the outside of a mold cell eventually activates *freq* inside the nucleus. They also want to examine the light-induced response of *per*, a gene considered crucial to the biological clock of fruit flies. In contrast to *freq*, *per*'s activity peaks at night. As a result, notes Dunlap, light should produce the opposite response from the fruit fly gene. "We predict *per* expression will drop rapidly," he says.